

whereby the routine **150** determines the best fitting pixel image from the nine-by-nine format to display at a particular pixel or sub-pixel of the display device **70**. At a given pixel or sub-pixel of the display device **70**, the routine **150** may determine that a pixel from the leftmost perspective image may best be displayed at that pixel or sub-pixel. This determination may be based on where the pixel or sub-pixel is positioned in relation to a lenticule **79**, and may thereby be calculated for every row or group of pixels or sub-pixels within a particular lenticule **79**. Calculations may be performed by any known methods such as those described in co-pending application Ser. No. 10/661,983, entitled "Three-Dimensional Autostereoscopic Image Display For A Gaming Apparatus", filed Sep. 12, 2003, which is incorporated by reference herein in its entirety for all purposes.

[0050] When a particular perspective image has been chosen as the best perspective for a particular pixel or sub-pixel, block **156** may further include determining which pixel of the chosen perspective image should be displayed at the pixel or sub-pixel of the display device **70**. This may be determined simply by mapping the desired interdigitated sub-pixel or pixel being calculated to the chosen perspective image(s). For example, if the best perspective image is image **5**, then the pixel image taken from image **5** may be determined by mapping the location of the pixel or sub-pixel of the final single image (which includes all perspectives) to the coordinates of image **5**. Generally, the best fitting pixel mapped from each master image should be used, though a weighted average of the values of several pixels that map to a desired range may also be appropriate.

[0051] In some cases, the perspective images may be the same size and/or resolution of the final image of the various perspectives, though the perspective images may also be smaller to simplify the process described above. In either case, pixels may be mapped proportionally from the appropriate perspective image(s) to the final, interdigitated image. For example, the final interdigitated image being calculated may have a grid of 4800 sub-pixels horizontally (which would be the case if the horizontal display resolution was 1600 RGB pixels, and each of those 1600 pixels consisted of three distinct single-color sub-pixels), and 1024 sub-pixels vertically, and the perspective images may each have a smaller resolution of 520 pixels horizontally by 340 vertically. To calculate the value of interdigitated sub-pixel (X,Y) of the final interdigitated image, the best fitting master image pixel may be $(X \times 520 / 4800, Y \times 340 / 1024)$, where the lower-left pixel in all cases is (0,0). Thus, while the perspective image may have a resolution only a fraction of the display device **70**, the routine **150** may determine what is the best fitting pixel from the perspective view.

[0052] The above techniques apply regardless of whether the lenticules **79** are parallel to the pixel columns of the display screen **71** or slanted relative to the pixel columns. The only difference between lenticules **79** that are not slanted and lenticules **79** that are slanted is that a slanted lenticule **79** implementation may consider the amount of slant (i.e., the angle) in order to properly calculate the horizontal position L of a pixel relative to the lenticule **79** that is placed above it. If the interdigitated sub-pixel being calculated is red-only, green-only, or blue-only, then only the appropriate color element from the master image pixel(s) may be used.

[0053] Once the mapping or interdigitation process is complete, the interdigitated image data may be stored at block **158**, with each pixel of the interdigitated image having been

assigned a pixel or sub-pixel on the display device **70**. The interdigitated image data is made up of the image data from the various perspective views whose pixels are mapped to be precisely positioned with the lenticules **79** of the lenticular screen **73**. A digital video interface may ensure that each pixel image of the interdigitated image is displayed at the proper pixel or sub-pixel of the display device **70**. At block **160**, the routine **150** determines whether all images have been processed. If not, the routine **150** may return to block **152** to repeat the process for another image. If complete, the routine **150** may end the process and the interdigitated image data may be displayed on the display device **70**.

[0054] Any image displayed on the display device **70** may be displayed as a three-dimensional display, which may sometimes be referred to as an autostereoscopic display. Generally, an autostereoscopic display may involve a technique that allows the player/observer to see depth in the image by combining the perspective images and simultaneously looking at two perspectives of an image without requiring additional viewing glasses or the like. This effect may be accomplished by displaying the interdigitated data with the lenticular screen **73**. As discussed above, various perspective views of an object, scene or other image may be interdigitated and stored as interdigitated data. The interdigitated data may be displayed as a combination of multiple perspective views with each view having the appearance of three-dimensions.

[0055] FIG. 4 is a flowchart of a display routine **430** of the 3-D video data that may be stored in the memory **334** of the master gaming controller **332** (FIG. 7). The display routine **430** may begin operation at block **432** during which interdigitated data may be received by the master gaming controller **332** (FIG. 7) and temporarily stored in a memory **334** such as the random-access memory **334** (RAM) **340** (FIG. 7). The interdigitated data may represent a single or multiple images each having multiple perspectives which may be static or animated images. For example, the master gaming controller **332** may receive and store an entire video file of interdigitated data or receive the video file on a frame-by-frame basis.

[0056] When the interdigitated data has been received, the master gaming controller **332** may read the interdigitated data at block **434** in order to read and display the three-dimensional, autostereoscopic image. In reading the data, the master gaming controller **332** may read pixel data and mapping information which may be encoded as part of the interdigitated data. The pixel data may allow the master gaming controller **332** to determine the color, intensity, placement, etc. of each pixel or sub-pixel image. The mapping information may allow the master gaming controller **332** to determine where a particular pixel image is to be displayed on the display device **70** such that the player/observer will be able to clearly view multiple perspectives of the image. When the master gaming controller **332** has read the interdigitated data of the image, the master gaming controller **332** may cause the image data to be displayed on the display device **70**. Using the mapping data, the master gaming controller **332** may cause each pixel image, or sub-pixel image, to be displayed on a particular pixel or sub-pixel of the display screen **71**. The display of the image at block **436** may be performed using a digital video interface (DVI). When displayed according to the mapping data and viewed in conjunction with the lenticular screen **73**, the image may have the appearance of three-dimensions with multiple perspectives that change with the viewing angle.